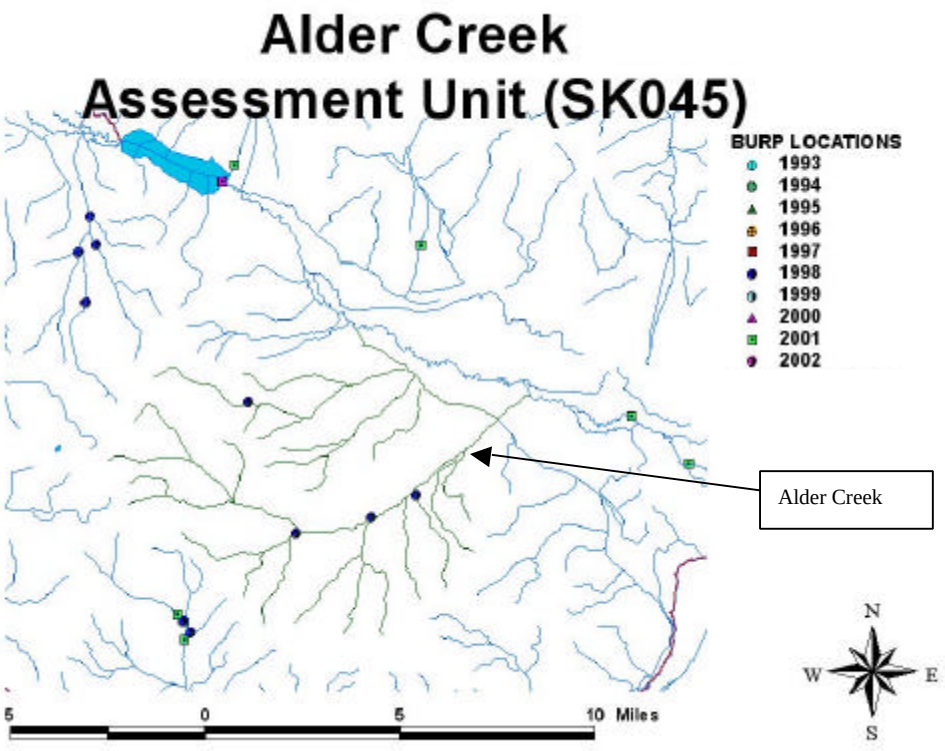

Figure 50. Alder Creek assessment unit.

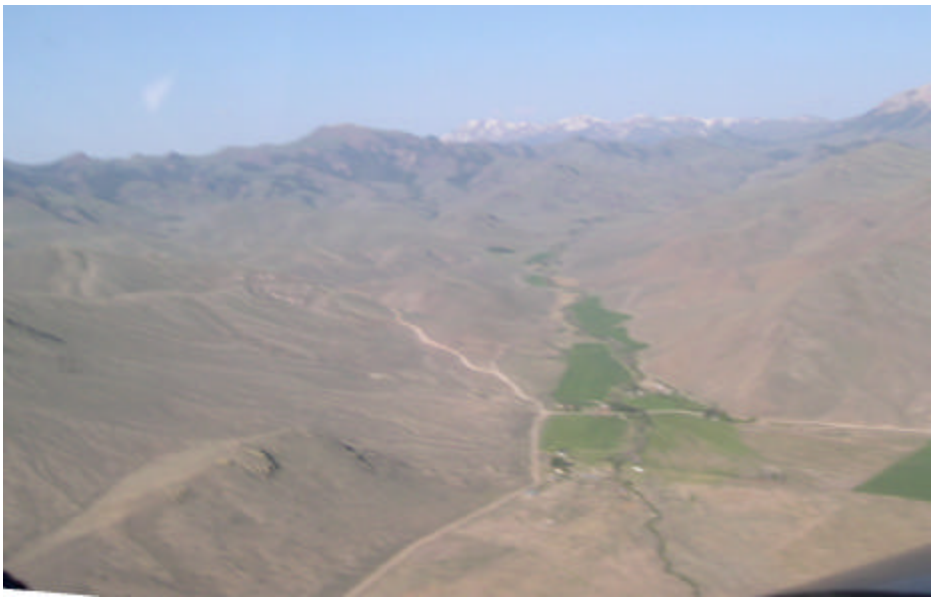

Figure 51. Alder Creek Valley looking west toward historic mines.

The Big Lost River below the Beck and Evan Ditch has perennial flow and continues within an area that includes irrigated agriculture and low density residences (Figure 52). Flow decreases over this reach during the irrigation season and in the off season when the reservoir is filling. Tributary in-flow is largely intercepted along this reach by diversions and in-stream habitat quality progressively degrades as a result of altered flow regime though fishing remains good through this reach at times. Land management is exclusively private.

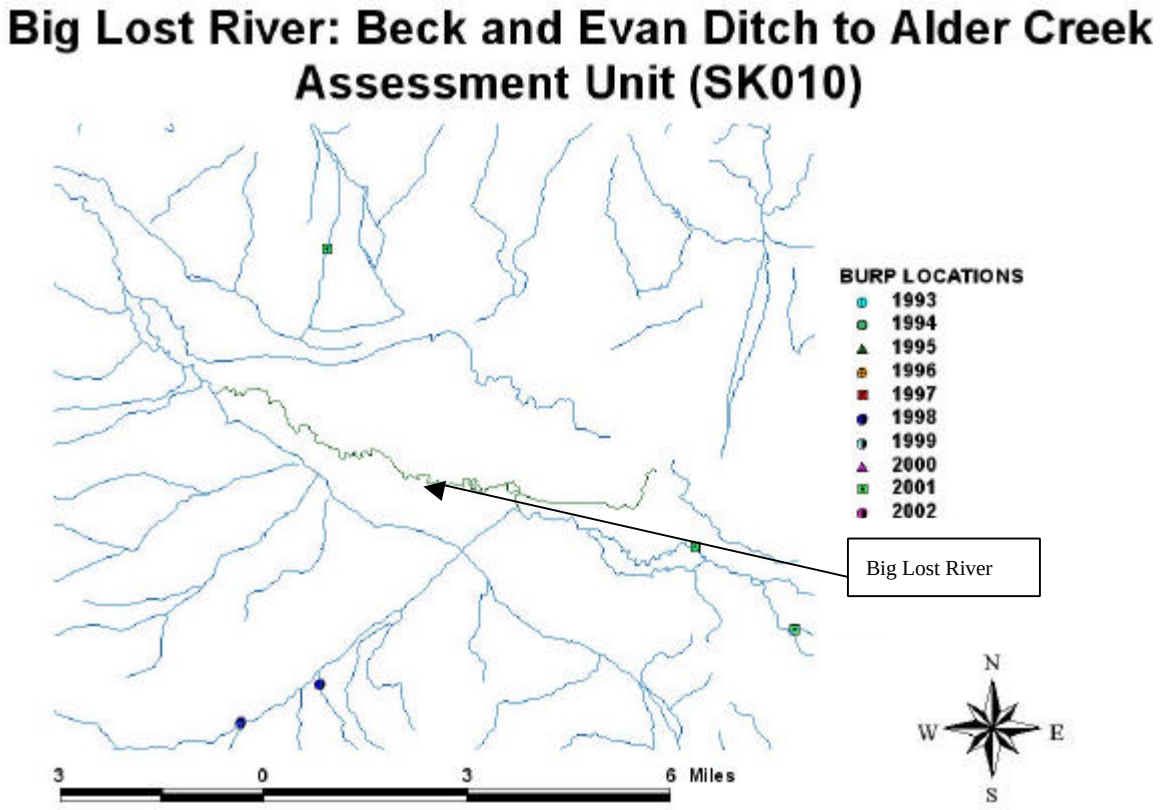

Figure 52. Big Lost River Beck and Evan Ditch to Alder Creek assessment unit.

Antelope Creek rarely flows to its confluence with the Big Lost River as it too infiltrates into the deep alluvium of the valley floor (Figure 53). The Darlington Sinks occur just above the Antelope Creek channel confluence and the Big Lost River is largely a loosing channel below this point to the Moore Diversion. Riparian vegetation progressively looses vigor and diversity throughout the reach and the stream becomes ephemeral to the Moore Diversion where flow seldom passes in the natural channel due to the combined effect of infiltration and irrigation diversion. Land management remains private and agricultural land use dominates along this reach. Recreation is limited due to access across private land and sporadic flow conditions. Irrigation becomes increasingly dependent upon groundwater pumping below this reach. There are few perennial streams below this Assessment Unit other than Pass Creek and no streams that are perennial consistently contribute flow to the Big Lost River below this point.

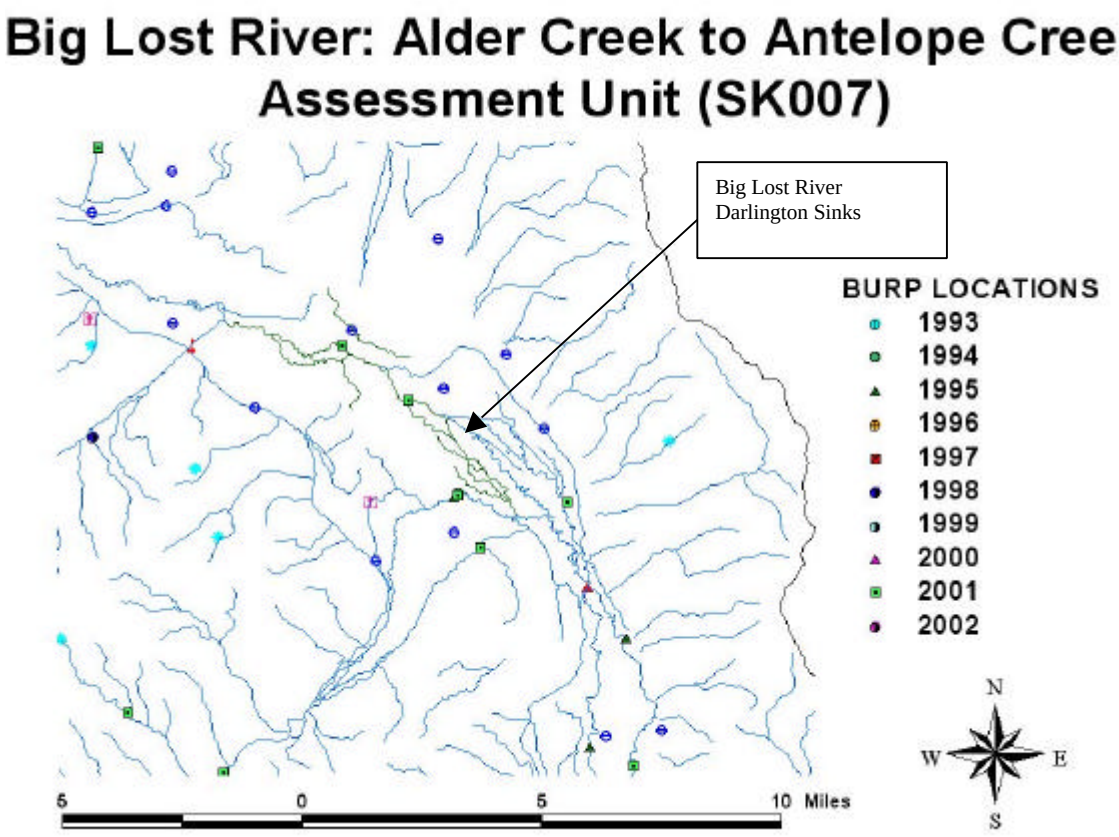

Figure 53. Big Lost River Alder Creek to Antelope Creek assessment unit.

The Lower Pass Creek Assessment Unit (Figure 54) consists of a number of springs that evolve at the toe of the Holocene terrace of the Big Lost River channel combined with historic channels of the Big Lost River. Flow from the springs is largely made up of aquifer recharge from irrigation on the bench above the terrace. This is a common situation that is seen in other watersheds of the Central Valleys of Idaho such as the Lemhi River, Pahsimeroi River and the Little Lost River to the east. Flow varies throughout the year and depends upon application rates of irrigation water and the lag time to surface expression at the base of the terrace. Surface irrigation return water is also a contributor to this flow.

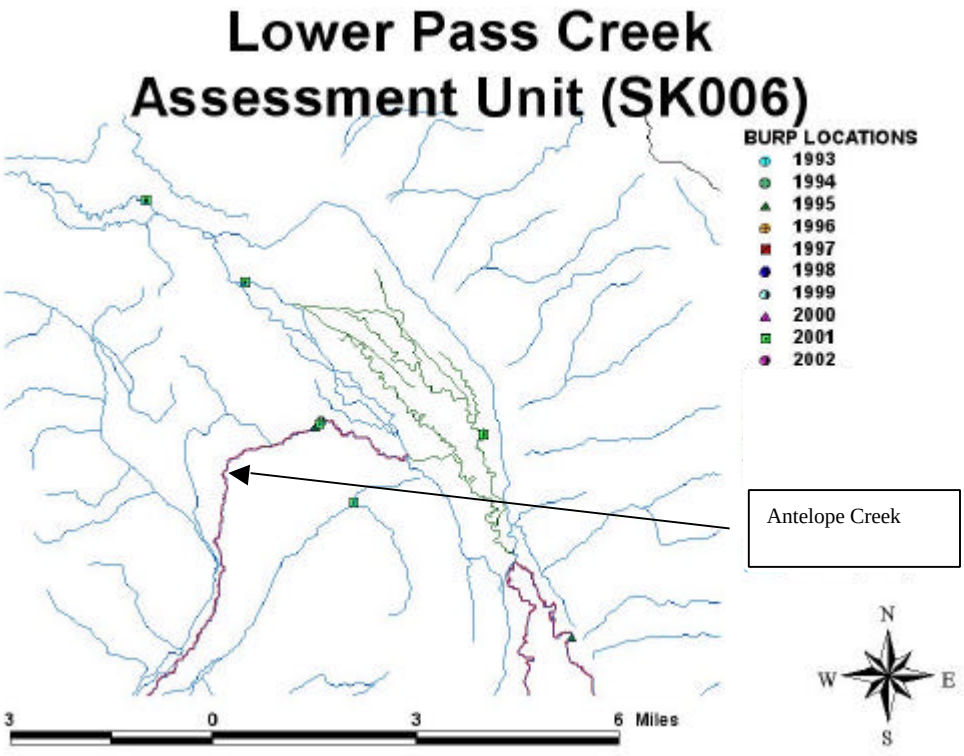

Figure 54. Lower Pass Creek assessment unit.

Pass Creek is the most significant perennial flow that originates in the Lost River Range within the Big Lost River watershed (Figure 55). It is named because it flows within the canyon that creates the Pass between the Big Lost River and Little Lost River watersheds. Pass Creek Road parallels Pass Creek from its lowest point of surface flow at the mouth of its canyon, to the watershed divide. Pass Creek is completely consumed for irrigation at the mouth of the canyon and does not connect with other natural surface flow below this point. Land management is almost exclusively Forest Service with the exception of a small private parcel below the confluence of Methodist Creek and private land at the mouth of the canyon where Pass Creek is completely diverted. Land use above the point of permanent diversion is a combination of livestock grazing, transportation and recreation. There are no developed campgrounds in the watershed. Recreation is dispersed camping, hiking, hunting, fishing, and motorized and nonmotorized trail riding as well as horseback riding.

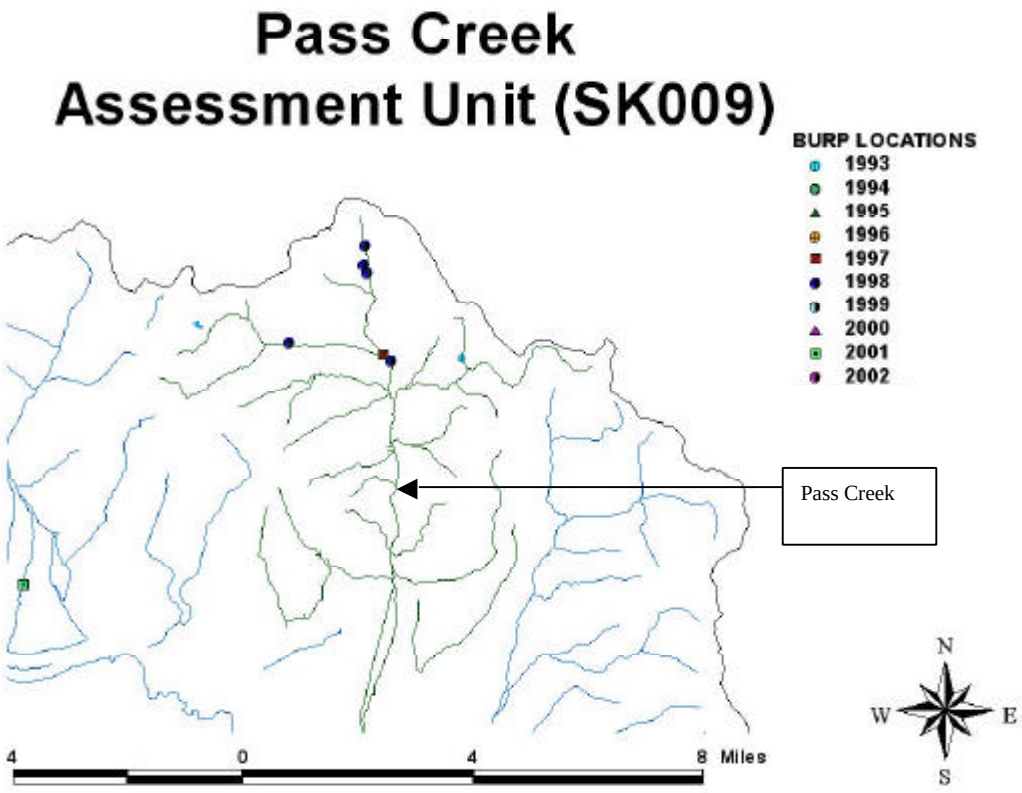

Figure 55. Pass Creek assessment unit.

The Elbow Creek to Jaggles Creek Assessment Unit refers to a collection of ephemeral drainages that originate in the Lost River Range and are affiliated with small canyons that open to the valley floor uplands above the flow altered segment of the Big Lost River (Figures 56 through 62). There are no fisheries or aquatic life values to these features. There are no BURP sites other than on the mainstem Big Lost below the Spring Creek side channel (Figure 59). In fact there are no aquatic systems that evolve from the Lost River Range over the remaining course of the Big Lost River to the Big Lost River Sinks on the lava plain desert. Any flow that did make it to the valley floor would be intercepted by the Beck and Evan Ditch or the East Side Ditch before connecting to the Big Lost River. Land management over the remainder of the lower watershed maintains the proportion of Forest Service in the upper elevations, BLM in the intermediate elevations, and private along the channel in the valley bottom. Land use is agricultural over the remaining lower watershed and includes crop production, livestock grazing, livestock feeding operations and residential development. Groundwater pumping and surface diversion facilitate agriculture

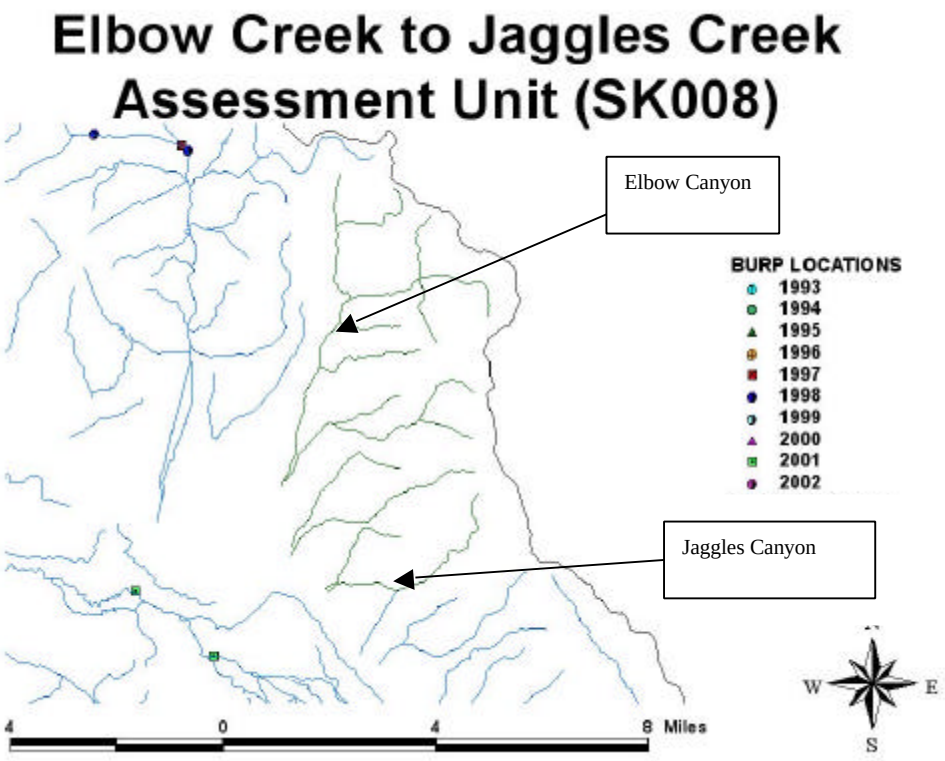

Figure 56. Elbow to Jaggles Creek assessment unit.

Flow alteration is dramatic in the Big Lost River at the Moore Diversion Structure and the 303(d) listed reach corresponds to the dry channel from the Moore Diversion to Highway 26. This reach would be naturally dry due to infiltration of flow into alluvium, combined with the lack of surface flow from tributaries to the Big Lost River Channel. Riparian vegetation is greatly diminished below this point and generally corresponds to places where surface irrigation water is returned to the dry channel for aquifer recharge. Below Highway 26 the Big Lost River is historically ephemeral to the Playas, or Sinks as they are locally known.

Figure 57. Moore Diversion showing irrigation ditches on the left and right and the dewatered natural channel and "Spring Creek" in the middle.

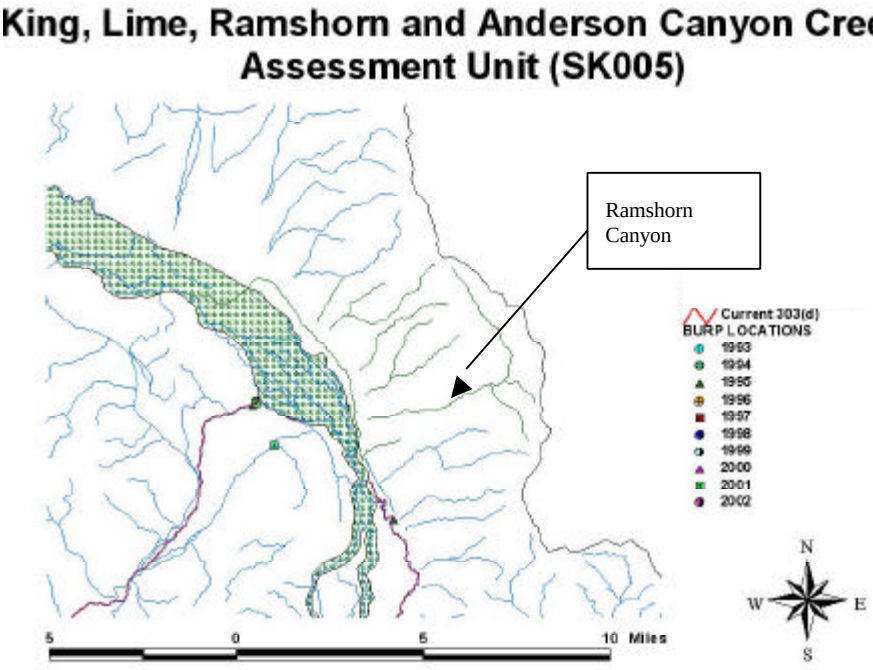

Figure 58. King, Lime, Ramshorn and Anderson Canyon assessment units.

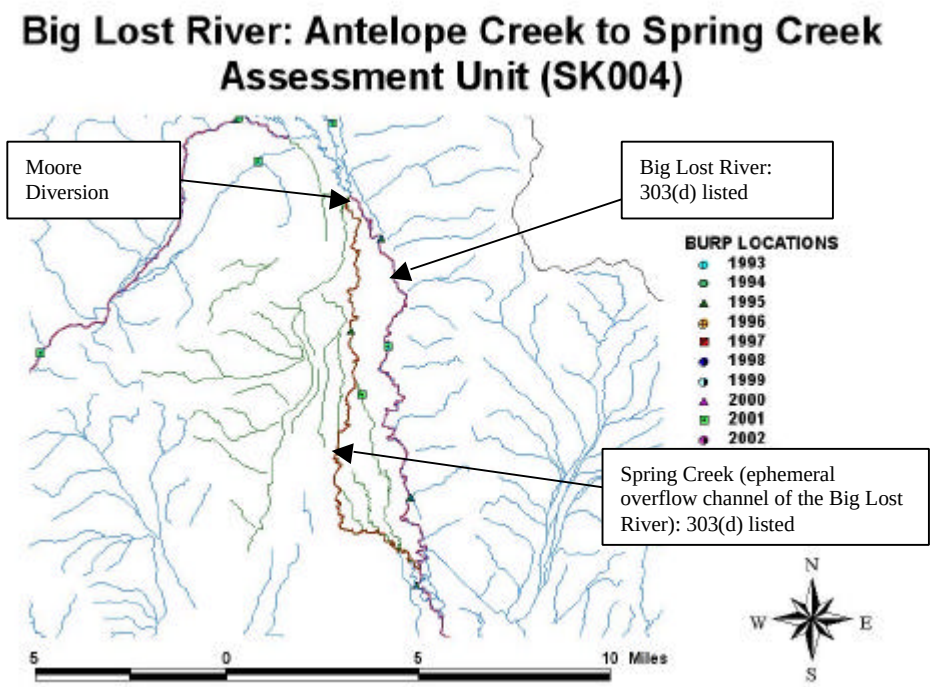

Figure 59. Big Lost River Antelope Creek to Spring Creek assessment unit.

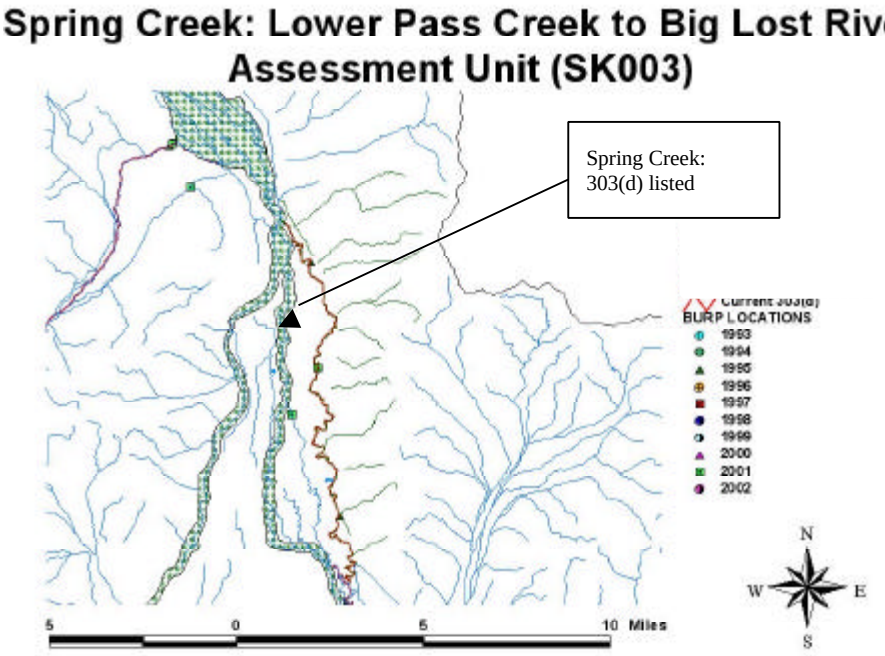

Figure 60. Spring Creek channel of the Big Lost River assessment unit.

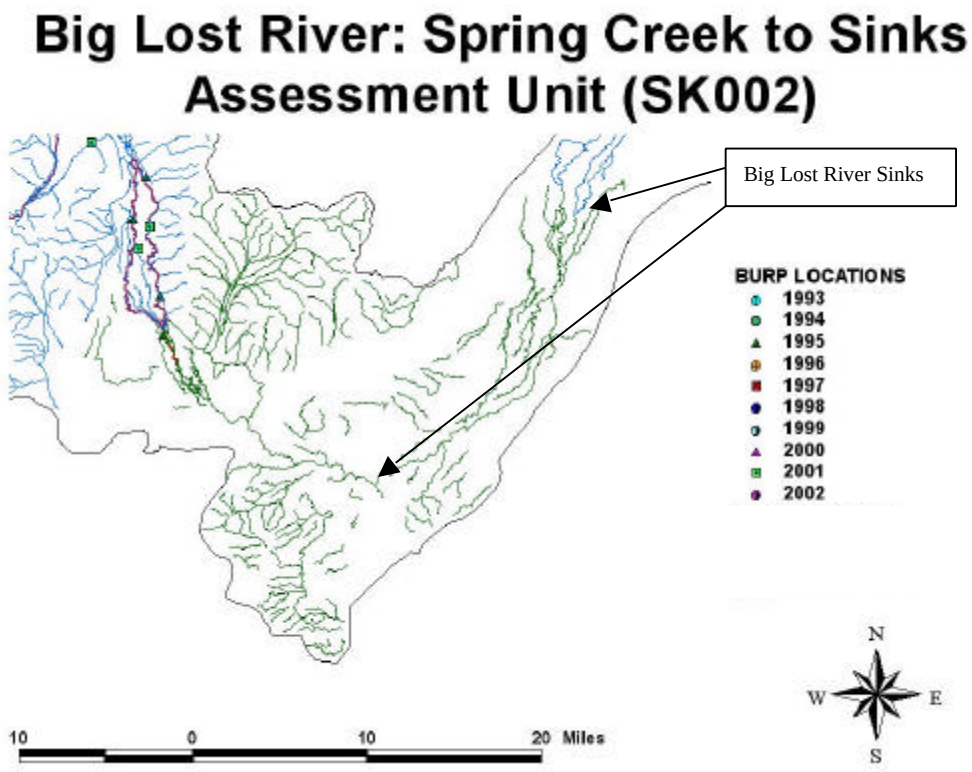

Figure 61. Spring Creek Channel to Sinks assessment unit.

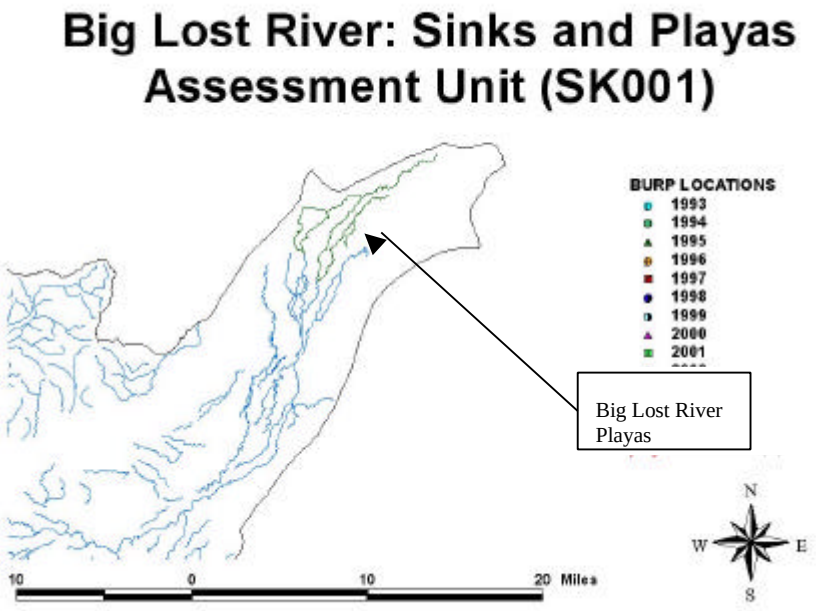

Figure 62. Sinks and Playas assessment unit.

1.3 Cultural Characteristics

The Big Lost River watershed lies within Butte and Custer Counties, and like the adjacent Central Valleys of Idaho is sparsely populated. The City of Arco, Idaho is the largest population followed by the City of Mackay, Idaho. Three State Highways serve the watershed. Highway 20 runs east and west from Idaho Falls to Mountain Home and 93 connects with 20 in Arco and connects with Challis and Salmon to the north. Just south of Arco Highway 33 makes its Junction with Highway 20 and connects to Rexburg through Howe, Mud Lake and Terreton. At Mud Lake Highway 28 splits off to the north to connect with Salmon, Idaho through the Birch Creek and Lemhi Watersheds. The Big Lost River watershed lies to the northwest of the Idaho National Environmental and Engineering Laboratory, which is the largest employer in the region with over 7,000 employees.

History

The Big and Little Lost River valleys have seen many visitors who left no traces of their presence. Each of these Central Valleys was a route for fur trapping parties between 1813 and the 1840s. For a number of years after the trappers left, little took place in the area, but after European visitors came again, this time to search for precious metals, some stayed and small farming communities began to form.

Native Americans were known to use the area of the Big Lost River for probably 10,000 years prior to settlement by European-Americans (Hatzenbuehler, 2003). The Big Lost River Valley was primarily a seasonal migration corridor for the Shoshone and less numerous Bannock and Paiute Native Americans as they moved to and from the Salmon River watershed. Within the Salmon River watershed they hunted trout and salmon and big game animals for food and related animal products such as bone tools and rendered oil. The Big Lost Valley, with harsh winters and arid climate did not offer sufficient resources throughout the year to allow for permanent settlement there (Hatzenbuehler, 2003).

The Lewis and Clark Expedition discovered what is present day Idaho, in 1805. They noted large herds of horses, up to 700 animals, in a Shoshone village in the Lemhi Valley. They estimated that there were thousands more in the hills (Galbraith and Anderson, 1969).

Shortly after the Lewis and Clark Expedition, trappers exploited the area for furs to supply the growing demand in Europe and the eastern United States for garment furs and hats. In 1810 the Missouri Fur Company established Fort Henry near present day St. Anthony, Idaho, which was the first American trading post in the west. By 1834 a trading post was established near present day Fort Hall. It was sold to the Hudson Bay Company in 1837 (Kempthorne, 2000). Both of these posts were within range of trading furs harvested in the Big Lost River Valley. Fort Hall acted as a hub for trails and roads to the western parts of the United States, and to the central part of Idaho through the Big Lost River Valley.

By the 1840's Idaho's fur resources were becoming depleted and the demand for furs was in decline. A few trappers began to settle in the Oregon Territory, in what is now the Central Valleys of Idaho. Eastern newspapers painted a flowery picture of the Oregon Territory.

People from the eastern United States began to pass through the area and increasing numbers of pioneers decided to settle. By 1843 the Oregon Trail was established in Idaho, which passed by Fort Hall. Combined with the discovery of Gold, in California, and subsequently in other areas of the Northwest, including Pierce, Idaho on Orofino Creek in 1860, the flow of people increased. The area north of the 42nd parallel and east of the Oregon Territory became the Idaho Territory in 1863.

In the 1880s railroads were constructed across Idaho spurring the expansion of mining and later the development of lumbering. This in-turn resulted in the development of farming and ranching in Idaho to supply food to the mining and lumbering camps (Hatzenbuehler, 2003).

A stage line, started by Alexander Toponce, connected the Salmon River mines and Challis with the railroad at Blackfoot. A stage station was established on the Big Lost River to serve this line. It was known as Kennedy Crossing and was about 5 miles south of the present town of Arco. Because the Challis route and another leading to the Wood River joined here, application was made for a post office, to be named Junction. There were too many places named Junction and the postal service did not want another one. The U.S. Post Office suggested the name of Arco, to honor a visiting Count, who had never been to Idaho. The citizens needed postal service and accepted the name. In 1880, the stage station moved to another site south of the present town and remained there until the Mackay Branch of the Oregon Short Line Railroad Company was built through the area in 1901 (Link 1996).

The railroads also provided access to eastern markets for beef. During the 1840s and 1850s cattle multiplied rapidly in the Pacific Northwest, particularly in western Oregon. Mass movements of cattle took place from western Oregon to east of the Cascades during the 1860s. The range conditions of the central valleys of Idaho were considered excellent for production of beef and subsequently sheep. Great cattle drives from Texas supplied base stock for herds in Wyoming and Montana in the 1850s and 1860s. Cattle from the Northwest were considered by Wyoming buyers to be superior to Texas cattle as a base to build herds. After 1876 the majority of cattle were supplied from Nevada, Utah, and Idaho (Galbraith and Anderson, 1969).

By 1885 the cattle industry had overexpanded in Washington, Oregon, and Idaho (Galbraith and Anderson, 1969). Overgrazing had resulted in degraded range conditions, extensive erosion, and replacement of bunchgrass with sagebrush. Sheep grazing was on the increase during this time. Sheep could be grazed less expensively than cattle and were often put on the range before conditions were good, furthering the degradation of range conditions and increasing erosion. This led to the belief that sheep were the chief cause of range deterioration (Galbraith and Anderson, 1969) though much of the damage was already done by cattle. In 1884 a railhead was established in Hailey, Idaho and became the largest depot in the state for shipping mining supplies and sheep. Sheep were commonly herded over Trail Creek summit into the Big Lost River watershed for grazing in spring and summer and then herded out to Hailey for shipping. By 1910 grazing laws were developed and put into effect in National Forests to try and control the damage being done to rangeland throughout the region (Galbraith and Anderson, 1969).

The demands, resulting from World War I, for wheat resulted in conversion of range land in some areas of the United States to wheat production. Ultimately this resulted in the increased

price for cattle and sheep. This prosperity resulted in animosity toward the control of rangeland grazing. Combined with the depression of the 1930's, countrywide drought, and the visible destruction of rangeland brought about a change in public attitude. By the mid-1930s the public was ready for meaningful controls of grazing management (Galbraith and Anderson, 1969). This led to the creation of the Soil Conservation Service in 1935. In 1934, Congress passed the Taylor Grazing Act, which placed administration of unappropriated public lands under the Division of Grazing, which later became the Grazing Service and then the Bureau of Land Management under the Department of the Interior.

Irrigation development came late in the 1800s as the population increased and a railhead was established in Mackay, Idaho in 1901. During its mining heyday, Mackay boasted a population of over 5,000 people with businesses to match. The Mackay Reservoir was started in 1906 and completed in 1930 following a tumultuous history of water wars. In the 1920s and early 1930s much thought went into building canals and ditches to get surface flow past the natural sinks where surface water would infiltrate to ground water. The primary sinks were at Chilly Buttes, Darlington, and at the Moore Diversion on the Big Lost River. Antelope Creek sinks were located above the mouth of the canyon. Rarely would the Big Lost River, or Antelope Creek flow beyond the sinks, and that was for the short duration of the heaviest runoff. Irrigators viewed this as wasted or lost water and were continually evaluating the cost effectiveness of pumping groundwater back to the surface, or constructing ditches that would prevent the loss of water. One of the major constraints was cost, but the volume of water during heavy runoff was also a limiting factor. It was felt that much of the infiltrated water of the Big Lost would "reappear" at the valley constriction where Mackey Dam is now located, though there were differing views among hydrologists and irrigation groups.

Land Use

Today approximately 80% of the subbasin is under BLM and Forest Service management and 16% DOE. State and Private land total 4%. Much of the DOE land includes rangeland and most of the remaining 84% of land ownership would be considered rangeland (Table 5), which can be considered grassland and sagebrush habitat on much of the federal and private land. However, on private land sagebrush is often removed to the extent possible to produce pasture. Land use closely parallels land ownership with agriculture the most widespread land use in the watershed. Irrigated cropland and pasture would occur within the remaining portion of Private land (less than 2%). Figure 63 shows the wide distribution of federal rangeland throughout the subbasin. Evergreen Forest and mixed forestland are the next most major land cover, though this is also used mostly for grazing. Steep terrain and low-density, poor quality stands limit logging opportunity in the watershed. Mining is no longer active in the watershed, and at its historical peak would have involved less than 1% of the land.

Land Ownership, Cultural Features, and Population

Most of the Big Lost River subbasin falls within Custer County with about 25% in Butte County with a small area at the most eastern edge in Jefferson County. Table 5 shows that 98% of land ownership is public with the majority of land being managed by the BLM (30%) and the USFS (50%). The state of Idaho (2%) manages small parcels scattered throughout BLM land. The

Department of Energy's (16%) boundaries are located at the most south eastern end of the subbasin. Private land only accounts for 2% of the land ownership in the subbasin.

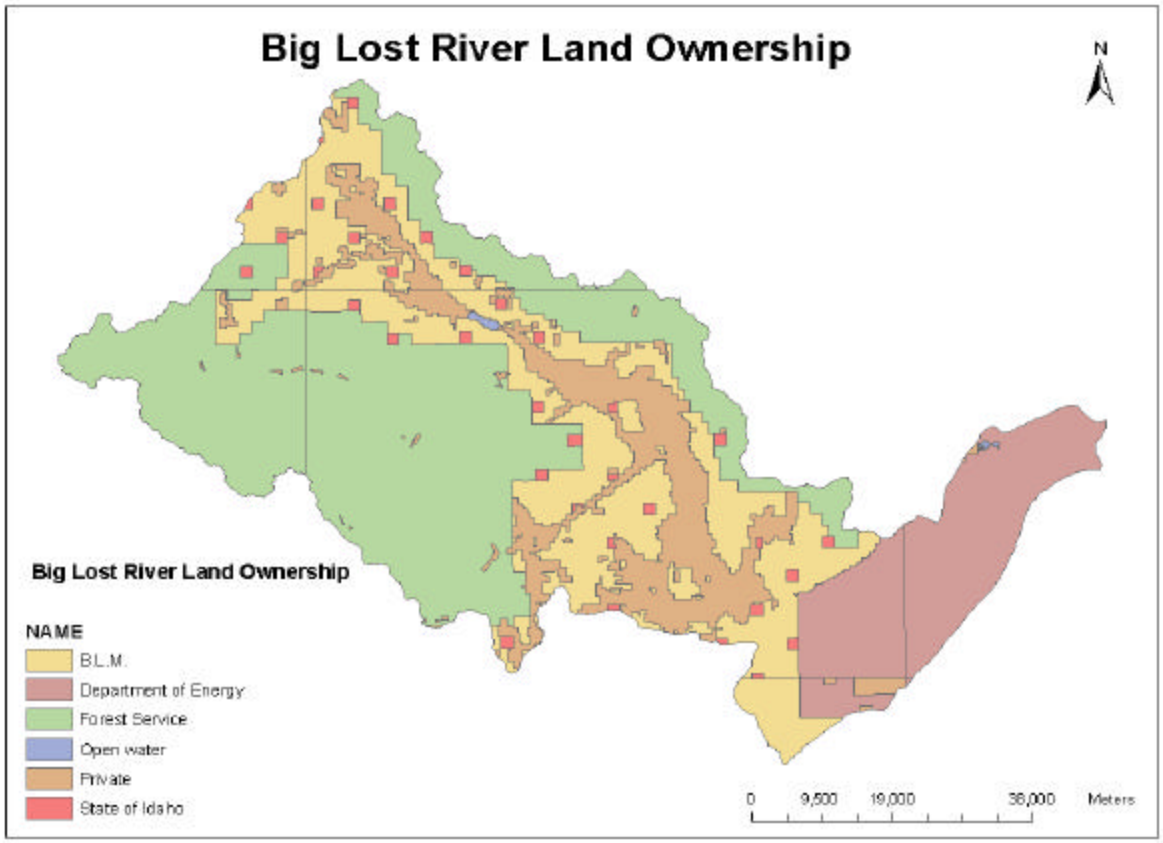

Figure 63. Land ownership in the Big Lost River watershed.

Table 5. Land ownership within the Big Lost River Watershed.

Landowner	Acres	Sq. Miles	Sq. Km	% of Total
Private	18,404	29	74	2%
Public				
BLM	327,130	511	1,323	30%
Department of Energy	177,011	276	716	16%
USFS	534,316	834	2,162	50%
State of Idaho	19,219	30	77	2%
Open Water	1,652	3	7	<1%
Sub-total	1,059,328	1,654	4,285	98%
Total	1,077,732	1,683	4,359	100%

Economics

Today, the cities of Arco and Mackay are the largest population centers located in the Big Lost River Watershed. Many of the residents work at the Idaho National Engineering and Environmental Laboratory (INEEL) operated by the Department of Energy. Service related jobs and management and professional occupations make up the majority of occupations within the subbasin. Agriculture and natural resource related jobs are important in rural areas with 17.5% and 29.2% of workers in Butte and Custer Counties, but 60% in the unincorporated areas represented as Lost River in Table 6.

Historically mining and ranching provided the economic incentive for settlement. As the west was settled agriculture provided the majority of economic opportunity. Diversification of the regional economy has provided increased opportunity within the watershed for professional and managerial occupations. Tourism is expected to become increasingly important in the future. There have been numerous business proposals for the future in this area. Potential projects range from private space oriented launch and recovery facilities to reestablishing mining ventures.

Table 6. Profile of Selected Economic Characteristics for the Big Lost River Valley.

	Arco	Atomic City	Lost River	Mackay	Moore	Butte County	Custer County
Population	1,026	25	26	566	165	2,899	4,342
Unemployed (percent)	4.4	-	-	5.5	4.2	3.5	3.9
Occupation (percent)							
Management, Professional	29.2	33.3	60	27.6	35.0	36.7	35.1
Service	22.5	-	20	17.1	13.8	16.2	13.1
Sales and Office	21.8	33.3	-	25.0	28.8	20.1	20.4
Farming,Natural Resources	1.2	-	-	2.6	-	4.3	5.2
Construction/Extraction/ Maintenance	13.9	-	-	14.9	13.8	10.8	17.2
Production/Transportation	11.5	33.3	20	12.7	8.8	12.0	9.1
Industry (percent)							
Agriculture/Natural Resources	4.1	-	60	10.5	-	17.5	29.2
Construction	10.8	33.3	-	13.2	20.0	8.0	8.6
Manufacturing	1.7	-	20	4.4	5.0	3.8	2.9
Wholesale Trade	1.4	-	-	3.1	2.5	2.0	0.9
Retail Trade	8.6	-	-	7.0	22.5	9.2	10.5
Transportation/ Warehousing/Utilities	5.3	-	-	13.6	2.5	8.5	8.0
Information	1.2	-	-	0.9	-	1.0	1.6
Finance, insurance, real estate, and rental	4.8	-	-	3.9	8.8	3.4	3.0
Professional, scientific, management, administrative/waste management	11.2	66.7	-	7.0	10.0	8.8	4.1
Educational, health and social services	26.6	-	20	19.7	17.5	20.1	15.6
Arts, Entertainment, Food Service, Accommodation	10.3	-	-	9.2	8.8	6.4	8.2
Other Services	3.3	-	-	3.5	-	3.8	3.0
Public Administration	10.8	-	-	3.9	2.5	7.3	4.4

Source: U.S. Bureau of the Census, Census 2000